

# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : RICOH CO LTD

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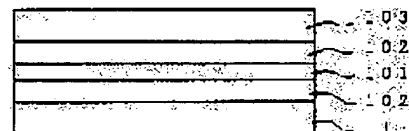
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## (54) SEMICONDUCTOR LAMINATION STRUCTURE AND SEMICONDUCTOR LIGHT EMITTING ELEMENT

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a semiconductor lamination structure and a semiconductor light emitting element by which such a light emitting element that can reduce taking-in of nitrogen on the surface of a guide layer or a clad layer adjoining to an active layer and is excellent in crystallinity and light emitting efficiency and of which charactersitic temperature is high can be obtained.

SOLUTION: In a nitorogen-based V group mixed crystal semiconductor containing N(nitrogen) as V group element, an  $\text{Al}_x\text{Ga}_y\text{In}_{1-x-y}\text{N}_z\text{P}_{1-z}$  layer 101( $0 \leq x < 1$ ,  $0 < y \leq 1$ ,  $0 < z < 1$ ) and an  $\text{Al}_x\text{Ga}_y\text{In}_{1-x-y}\text{P}$  layer 102( $0 \leq x < 2$ ,  $0 < y \leq 1$ ) whose Al composition is smaller than  $\text{Al}_x\text{Ga}_y\text{In}_{1-x-y}\text{P}$  are arranged between  $\text{Al}_x\text{Ga}_y\text{In}_{1-x-y}\text{P}$  layers 103 and 111( $0 \leq x < 2$ ,  $0 \leq y < 1$ ) whose Al composition is larger than the layer 101.



## LEGAL STATUS

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# PATENT ABSTRACTS OF JAPAN

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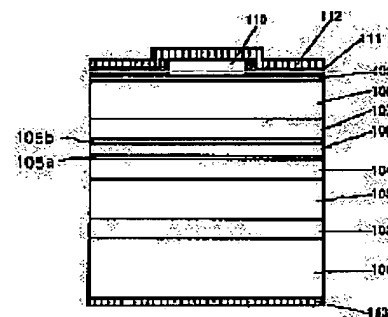
(72)Inventor : TAKAHASHI TAKASHI

## (54) SEMICONDUCTOR LIGHT EMITTING DEVICE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an AlGaInNP base semiconductor light emitting device by which light emitting efficiency can be improved.

**SOLUTION:** An n type GaAs buffer layer 102, an n type (Al<sub>0.7</sub>Ga<sub>0.3</sub>)<sub>0.5</sub>In<sub>0.5</sub>P clad layer 103, a non doped (Al<sub>0.5</sub>Ga<sub>0.5</sub>)<sub>0.5</sub>In<sub>0.5</sub>P lower light conductive wave layer 104, a non doped Ga<sub>0.5</sub>In<sub>0.5</sub>P intermediate layer 105a, a non doped Ga<sub>0.6</sub>In<sub>0.4</sub>N<sub>0.01</sub>P<sub>0.99</sub> light emitting layer 106, a non doped Ga<sub>0.5</sub>In<sub>0.5</sub>P intermediate layer 105b, a non doped (Al<sub>0.5</sub>Ga<sub>0.5</sub>)<sub>0.5</sub>In<sub>0.5</sub>P upper light conducting wave layer 107, a p type (Al<sub>0.7</sub>Ga<sub>0.3</sub>)<sub>0.5</sub>In<sub>0.5</sub>P clad layer 108, a p type Ga<sub>0.5</sub>In<sub>0.5</sub>P spike preventing layer 109, and a p type GaAs contact layer 110, are layered in sequence on an n type GaAs substrate 110.



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